POLICY RESEARCH WORKING PAPER 2485

Are Corruption and Taxation Really Harmful to Growth?

Firm-Level Evidence

Evidence from Uganda confirms that corruption retards development even more than taxation does.

Raymond Fisman
Jakob Svensson

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Summary findings

Exploiting a unique data set containing information about the estimated bribe payments of Ugandan firms, Fisman and Svensson study the relationship between bribe payments, taxes, and firm growth in Uganda for the period 1995–97.

Using industry-location averages to circumvent the potential problem of endogeneity and to deal with issues of measurement error, they find that both the rate of taxation and the rate of bribery are negatively correlated with firm growth. For the full data set, a one percentage point increase in the bribery rate is associated with a three percentage point reduction in firm growth—an effect about three times that of taxation.

Moreover, after excluding outliers, the authors find that bribery has a much greater negative impact on growth, and taxation a considerably smaller one.

This provides some validation of firm-level theories of corruption, which posit that corruption retards development even more than taxation does.

This paper—a product of Macroeconomics and Growth, Development Research Group—is part of a larger effort in the group to study the causes and consequences of corruption. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Rina Bonfield, room MC3-354, telephone 202-473-1248, fax 202-522-3518, email address abonfield@worldbank.org. Policy Research Working Papers are also posted on the Web at www.worldbank.org/research/workingpapers. The authors may be contacted at rf250@columbia.edu or jakob.svensson@iies.su.se. November 2000. (24 pages)

Are Corruption and Taxation Really Harmful to Growth? Firm Level Evidence

Raymond Fisman* and Jakob Svensson#

* Columbia Business School. 614 Uris Hall, Columbia University, New York, NY, 10027. Email: rf250@columbia.edu. Telephone: (212) 854-9157. Fax: (212) 316-9355
# Institute for International Economic Studies, Stockholm University, 106 91 Stockholm, Sweden, and DECRG, The World Bank. Email: jakob.svensson@iies.su.se. Telephone: (+46) 8 163060. Fax: (+46) 8 161443.
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I. Introduction

The debate on the effect of corruption on economic growth has been a hotly contested issue for several decades. Often, the effect of corruption is thought of as being something like a tax, differing primarily in that the payment does not end up as public revenues.[1] To the extent that this deprives the government of revenue required to provide productive public goods, corruption may be more detrimental to growth than taxation. More recently, Sheifer and Vishny (1993) have argued that corruption may be far more damaging than taxation, because of the uncertainty and secrecy that necessarily accompany bribery payments. On the other side, proponents of 'efficient corruption' claim that bribery may allow firms to get things done in an economy plagued by bureaucratic holdups.[2] Moreover, it has also been argued that a system built on bribery will lead to an efficient process for allocating licenses and government contracts, since the most efficient firms will be able to afford to pay the highest bribes (see Lui, 1985).

Hence, the issue of whether bribery is more harmful than taxation, or if, in fact, corruption is damaging at all, is primarily an empirical question. The relationship between growth and corruption has been examined extensively in the macro literature, beginning with Mauro (1995). In general, these studies find a negative correlation between corruption and GDP growth. On the issue of taxation versus bribery, Wei (1997) finds that bribery has a much stronger negative impact on foreign direct

[1] See Johnson, Kaufmann, & Shleifer (1998) on the public finance aspect of corruption, and Bardhan (1997), Tanzi (1998), and Wei (1999) for reviews of existing literature.
[2] See the discussion in Bardhan (1997). Kaufmann and Wei (1998) provide some indirect evidence in line with Myrdal's (1968) argument that corrupt officials may instead of speeding up, actually cause administrative delays in order to attract more bribes. See also Banerjee (1997).

investment than taxation. This body of work is based entirely on cross-country analyses, however, which always raises serious concerns about unobserved heterogeneity across data points. Moreover, the data on corruption is based on perception indexes, typically constructed from experts' assessments of overall corruption in a country, raising an additional concern about perception biases. Finally, the cross-country work on the relationship between corruption and growth tells us little about the effect of corruption on individual firms: for example, the negative relationship between growth and corruption at the country level may derive from an inefficient provision of public goods. If this were the case, corruption would not be damaging for the reasons cited by Shleifer and Vishny, and others that focus on firm-level theories of corruption.

In this paper, we take advantage of a unique data set that contains information on the estimated bribe payments of Ugandan firms. We find that there is a (weak) negative relationship between bribery payments and firm growth over the period 1995-97. After noting the potential problems of endogeneity and measurement error, we look at the relationship between firm growth and bribe payments, using industry-location averages as instruments, and find that the negative effect is considerably stronger. For the full data set, a one percentage point increase in the bribery rate (as defined by bribe payments divided by sales) is associated with a reduction in firm growth of more than three percentage points, an effect that is about 2.5 times greater than that of taxation. Moreover, after outliers are excluded, we find a much greater negative impact of bribery on growth, while the effect of taxation is considerably attenuated. This provides some validation for firm-level theories of corruption which posit that corruption retards the development process to a greater extent than taxation.

The rest of this paper is structured as follows: in Section II, we will describe the specification that we intend to use to examine the relationship between growth and corruption. Section III describes the data, including details of how our data on bribe payments were collected. The results are given in Section IV. Finally, Section V concludes.

II. Empirical Strategy

There are two main econometric issues of assessing whether corruption will have a significant retarding effect on growth: (i) problems due to measurement errors, and (ii) the fact that both growth and corruption are likely to be jointly determined. Below we discuss how we attempt to deal with these issues.

If bureaucrats can customize the nature and amount of harassment on firms to extract bribes, the "required bribe" will depend on the firm's willingness/ability to pay. Two firms in the same sector may thus need to pay different amounts in bribes, and the difference may be correlated with (unobservable) features influencing the growth trajectory of the firms. A simple example illustrates the point. Consider two firms in a given sector of similar size and age, which are located in the same region. One of the firms is producing a good/brand that is perceived to have a very favorable demand forecast, while the other firm is producing a good with much less favorable demand growth. Assume furthermore that the firms need to clear a certain number of business regulations and licensing requirements, and/or require some public infrastructure

services; moreover, assume that the bureaucrats have discretion in implementing and enforcing these regulations and services. A rational and profit maximizing bureaucrat would try to extract as high a bribe as possible, subject to the constraints that the firm might exit, and/or the bureaucrat may get caught. In this setup we would expect a bureaucrat to demand higher bribes from the firm producing the good with a favorable demand forecast, simply because this firm's expected profit are higher and, thus, its ability to pay larger. If the forecasts also influence the firms' willingness to invest and expand, we would expect (comparing these two firms) a positive (observed) relationship between corruption and growth.[3]

A second problem of endogeneity arises if firms may specialize in rent-seeking or efficiency as a means of growth. Some elements of bribery are likely to be relatively fixed across firms within a given industry, for example, the unofficial cost to being hooked up to the government power grid; paying off the local labor inspector; getting a telephone line installed. However, it is possible that firms may differentially choose to devote resources to obtaining valuable licenses, preferential market access, and so forth. Thus, some firms choose to compete based on costly preferential bureaucratic access, while others focus on improving productivity and investing in new capital (see for example Murphy et al., 1991). Both strategies may lead to growth, and in equilibrium, it is not clear that either firm type will grow more rapidly. This effect will tend to attenuate any measured effect between bribery and growth.

The preceding difficulties will tend to mask any direct negative effect that corruption has on growth. These problems may be mitigated by instrumenting for bribes.

[3] See Bliss & Di Tella (1997), for a more detailed theoretical analysis of these issues. Svensson (1999) provides evidence in line with this argument.

Our identification strategy can be laid out formally with minimal notational complexity by initially disregarding the relationship between growth and taxation. We can then state the relationship between firm growth (γ_{ij}) and corruption (b_{ij}) as:

$$\gamma_{ij} = \Gamma(b_{ij}(\theta_{ij}),\ p_{ij}, \theta_{ij}) \qquad (1)$$

where subscripts refers to firm i in sector j. In (1), θ_{ij} is a firm-specific (unobservable) factor that may impact both bribery rates and firm growth, p_{ij} is a variable capturing the firm's growth potential. The firm's growth potential can be decomposed into two parts,

$$p_{ij} = X'_{ij}\delta + \eta_{ij} \qquad (2)$$

where X_{ij} is a vector of observable characteristics, and η is a zero-mean error term.

Linearising the model yields,

$$\gamma_i = \beta_0 + \beta_b b_{ij} + X'_{ij}\delta + \beta_\theta \theta_{ij} + \eta_{ij}\ , \qquad (3)$$

Our previous discussion implies that the omitted variable θ_{ij} is correlated with both growth ($\beta_\theta \neq 0$) and bribery ($corr(b,\theta)\neq 0$). In line with the discussion in the introduction, we assume that $\beta_\theta > 0$ and $corr(b,\theta) > 0$. For example, we can think of the shifts in demand described above that is likely to influence both the "required" bribe and growth.[4] Assuming, for simplicity, that θ is essentially uncorrelated with X, this leads to the usual omitted variable bias; given our assumptions, the bias will be towards zero, resulting in an underestimate of the effects of bribery.

Following the discussion above, our identifying assumption to deal with this problem is that b_{ij} can be decomposed into two terms, one industry-specific, and the other particular to the firm:

$$b_{ij} = B_{ij} + B_j \tag{4}$$

In (4), B_j denotes the (average) amount of bribes common to industry-location j, which in turn is a function of the underlying characteristics inherent to that particular industry-location, determining to what extent bureaucrats can extract bribes, while B_{ij} denotes the idiosyncratic component. More importantly, since we assume that the industry-specific part of bribery is determined by underlying technologies and the rent-extraction talents and inclinations of bureaucrats, we assume that this component is exogenous to the firm, and hence uncorrelated with θ. For example, such industry-specific factors might include the extent to which the market for the produced goods is abroad, import reliance, and dependence of publicly provided infrastructure services. Likewise, we expect rent extraction through bribery to differ across locations simply because some bureaucrats may be more effective at extracting bribes than others. If this assumption is valid, we may use B_j to instrument for b_{ij}, since $\text{corr}(B_j,\theta)=0$. In such a specification, using industry-location averages as an instrument for firm-level bribery gets rid of the bias resulting from unobservables that are correlated with bribery at the firm, but not industry-location, level. Note that it is plausible that the same types of effects could potentially be at work at the industry level: bureaucrats could choose to victimize industries with high growth potential, thereby attenuating any relationship between growth and industry-

[4] The model could equivalently be framed in terms of simultaneously determined bribery rates and growth,

location bribery averages. Note, however, that these effects only work against our finding any effect. Thus, the IV-technique we employ is likely to provide a lower bound (in absolute terms) of the effect of bribery on growth.

The other significant estimation issue that we wish to address is the extent and impact of "noisy" data, which is a common concern when using micro-level data. Despite our data collection strategy outlined below, measurement errors, in particular in the bribe data, are likely to be of concern, simply because of the secretive nature of these data. Using grouped averages as instruments to deal with measurement error is a common technique.[5] In our case, the industry-location averages we use should serve to mitigate the effects of measurement error, since we generally think of these errors as being largely idiosyncratic to the firm, and hence uncorrelated with the average bribery values.

In a country such as Uganda, where tax authorities have a high degree of discretion (see Chen and Reinikka, 1999), we might expect that the relationship between effective tax rates (τ) a firm needs to pay and growth to be influenced by the same types of mechanisms. A rational tax collector (who may also be corrupt) can levy higher taxes on a firm with higher current or expected future profits, and the firm (given expectations of high future profits) may also be more willing to comply. Similarly, a firm may specialize in evading taxes and colluding with the tax collector, or improving productivity.

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leading to a simultaneity bias from OLS.

[5] See Wald (1940) for the original contribution.

Thus our empirical model is,

$$\gamma_i = \beta_0 + \beta_b b_i^{INS} + \beta_\tau \tau_i^{INS} + X_i'\delta + \eta_i \ , \qquad (5)$$

where b^{INS} and τ^{INS} are the fitted values from the first stage regressions, using location-industry averages of b and τ as instruments, and including the same vector of controls X as covariates.

III. Data

All data used in the paper is from the Ugandan Industrial Enterprise Survey (see Reinikka and Svensson, 1999 for details). This survey was initiated by the World Bank primarily to collect data on the constraints facing private enterprises in Uganda, and was implemented during the period January-June 1998. A total of 243 firms were interviewed in 5 locations, in 14 different industries.

Of primary concern is the issue of whether reliable data on corruption may be collected. For a long time it has been the common view that, given the secretive nature of corrupt activities, it would be virtually impossible to collect reliable quantitative information on corruption. However, Kaufmann (1997) and others have argued forcefully against this presumption. With appropriate survey methods and interview techniques firm managers are willing to discuss corruption with remarkable candor.

The empirical strategy utilized to collect information on bribe payments across firms in Uganda had the following six key components. First, the survey was implemented by an industry association (UMACIS). In Uganda, as in many other developing (and developed) countries, there is a rooted general distrust of the public sector. To avoid suspicion of the overall objective of the data collection effort it was therefore decided that a body that most firms had confidence in should implement the survey. Second, the corruption related questions (and the whole survey instrument) were carefully piloted and built on existing surveys on regulatory constraints. Third, the enumerators were trained by survey experts. Fourth, the questions on corruption were phrased in an indirect fashion to avoid implicating the respondent of wrongdoing.[6] Fifth, the corruption related questions were asked at the end of the interview, giving the enumerator time to establish necessary credibility and trust. Sixth, to enhance the reliability of the corruption data, multiple questions on corruption were asked (in different sections of the questionnaire). The survey instrument had roughly 500 entries, and a handful of them were related to corruption. Finally, the data collection effort was also aided by the fact that corruption to a large extent has been desensitized in Uganda. During the mid 1990s, several awareness-raising campaigns were implemented to emphasize the consequences of corruption, and by the time the survey took place, the media was regularly reporting on corruption-cases (See Uganda National Integrity Survey, 1998; Fighting Corruption in Uganda, 1998).

[6] For example, the key question on bribe payments were reported under the following question, "Many business people have told us that firms are often required to make informal payments to public officials to deal with customs, taxes, licenses, regulations, services, etc. Can you estimate what a firm in your line of business and of similar size and characteristics typically pays each year?"

176 firms, out of 243 sampled, responded to the question on bribery. Of the 67 firms that did not respond to the corruption question, about one third refused to answer other sensitive questions in the questionnaire; for example about costs and sales. As a group, the 46 firms that declined to answer questions about corruption in particular did not differ significantly with respect to size, profits, and location from the group of firms that gave answers to corruption-related questions. Thus, there is no (observable) evidence that the sample is not representative.

The reported bribe payments are highly correlated with other (indirect) measures of corruption, thus significantly enhancing our confidence in the reliability of the bribe data. The respondents were asked of the total costs (including informal payments) of getting connected to the public grid and acquiring a telephone line. As discussed in Svensson (2000), controlling for location (with respect to public grid), these are services that ex ante one would expect firms to pay the same amount for. Thus, deviations from the given price typically reflect graft. Of the 25 firms that had been connected to the public grid over the past three years, all reported positive bribe payments. The partial correlation (controlling for location) between connection costs and bribes is 0.67. The pattern is similar for deviations from the fixed price of telephone connection. Of those 77 firms that reported positive deviations, 15 did not report bribe data. The simple correlation between the excess price of telephone connection and reported bribe payment for the remaining firms is 0.41.

Obviously, when studying the relationship between bribes and growth it is necessary to somehow scale the level of bribe payments. The most natural approach

would be to look at bribes as a fraction of profits. This, however, would require perhaps excessive confidence in the abilities of Ugandan firms to produce accounts that adhere to some uniform standard. Instead, we deflate using firm sales, a figure that is much less prone to manipulation and misreporting. Thus, our measure of bribery is given by BRIBE=(bribe payments)/sales. Similarly, we measure tax rates by looking at taxes as a fraction of sales (TAX). Unfortunately, we only have bribery data for 1997; hence, both of these variables are calculated using data from that year. Two firms reported bribery rates in excess of 50 percent, while one firm reported a tax rate of more than 50 percent. Given that these values far exceed those reported by all other firms, we believe that these observations are the result of gross misreporting or erroneous recording of data and they are therefore dropped from the sample.

As our measure of firm growth, we use historical sales data, which was collected for 1995 and 1996.[7] To calculate a rate of growth, we use

GROWTH = [log(Sales in 1997) - log(Sales in 1995)]/2

Ideally, we would look at growth over a longer time horizon; our definition here is dictated by data limitations.

Since firm size may be correlated with bribe payments (as larger organizations are more visible to bureaucrats) and since size may also affect future growth, we include log(Sales in 1995) as a control (LSALES95). Similarly, we include the log of the firm's age (LAGE), which has been found to be correlated with growth in many firm-level

studies, and may be correlated with bribes if longer established firms have better access to both bank finance and official contacts. Firms involved in trade, either exporting or importing, may be more vulnerable for rent extraction and subject to greater bureaucratic scrutiny and regulation than firms with only local sales. Since a correlation between growth and trade has been reported in many studies, this will also be an important control. Hence, we include a dummy variable denoting whether a firm either exports or imports directly (TRADE). Finally, we include a variable denoting percent of foreign ownership (FOREIGN). Such firms may grow more quickly due to greater resources, access to markets, and technical expertise, while they may be exempt from bureaucratic harassment as an inducement to locate their operations in Uganda.[8]

Summary statistics and a correlation matrix for the basic variables are listed in Table 1.

IV. Estimation

As a benchmark we ran several regressions without controlling for the endogeneity and measurement biases. The results, allowing for a number of specifications, are listed in Table 2. As this Table indicates, there is only a weak association between rates of bribery and growth in firm sales (t-statistic is -1.38). Note, however, as discussed above, there are econometric problems that almost surely bias these coefficients toward zero. This is particularly true with respect to BRIBE.

[7] We obtained virtually identical results by using growth rates of firm profits and employment.

Controlling for foreign ownership, there is a statistically stronger relationship between taxation and growth.[9] The coefficient on TAX implies that a one-percentage point increase in the rate of taxation will reduce a firm's annual growth rate by about 0.5 percentage points.

To address the possible endogeneity and measurement error biases, we instrument for bribery and taxation rates using location-industry averages as instrument. The results from the IV-estimations, listed in Table 3, provide support for the hypothesis that both bribery and taxation have a retarding effect on growth. More precisely, the coefficient on *BRIBEIV* takes on values of about 3.5. This implies that a one-percentage point increase in the rate of "required" bribe payments will reduce a firm's annual growth rate by about 3.5 percentage points. The coefficient on *TAXIV* is approximately 1.5, implying approximately a 1.5 percentage point decline in annual growth from a one-percentage point increase in tax rates. Thus, consistent with both theoretical and cross-country evidence, corruption has a stronger negative impact on growth than taxation.

Note, however, that average bribery rates are lower than average tax rates - the mean and standard deviation for *BRIBEIV* are 0.012 and 0.012 respectively. Analogous statistics for *TAXIV* are 0.085 and 0.046. Thus, a firm in an industry at the 10^{th} percentile of bribery rates (*BRIBEIV* of approximately zero) will have a growth rate of 8.5 percentage points lower than a firm at the 90^{th} percentile (*BRIBEIV* = 0.023). A shift from the 10^{th} percentile of *TAXIV* (0.03) to the 90th percentile (0.14) will be related to a reduction in growth rate of 14.5 percentage points. So, taxation may have a larger impact

[8] Alternatively, one could easily imagine that foreign firms would be required to pay higher bribes since, as newcomers to the Ugandan market they lack appropriate government connections.

on growth than bribery, simply because tax rates are so much higher; however, on a per unit basis, these results suggest that bribery is much more damaging.

Robustness

Until now, we have taken an extremely conservative approach with respect to outliers: only three observations, which seem quite clearly to be a result of misreporting, have been dropped. However, some fairly serious outliers remain in the sample. In particular, there are four firms with changes in log sales of more than two, and one firm with a bribery rate of 0.2 (the second-highest value is 0.11). While there is no theoretical justification for deleting these observations, it would be of considerable concern if our results were completely driven by them. To examine this possibility, we determine the multivariate outliers for the three variables GROWTH, BRIBE, and TAX according to the method of Hadi (1994); similarly, multivariate outliers were determined for the second stage of the IV estimation. A total of 9 observations were flagged as outliers for specification (3) in Table 2, and 4 outliers were identified for specification (3) in Table 3.

Our analyses were repeated for both specifications, with these outliers excluded. The results, listed in Table 4, imply that the outlying observations were pushing the measured effect of bribery towards zero in both specifications: excluding outliers increases the coefficient on bribery rates by a factor of 5 in specification (1), and doubles the coefficient in the IV specification. By contrast, the growth-reducing effect of taxation suggested by the coefficient on both TAX in Table 2 and the instrumented tax rates in Table 3 seem to derive partly from a small number of extreme observations. Hence, the

[9] Holding other determinants constant, foreign firms on average pay higher taxes and grow faster.

effect of bribery increases substantially when a small number of rather dubious observations are omitted, while the effect of taxation lowers.

Note also that these estimates imply that bribery is more damaging on growth than taxation both on the margin and measured as total impact.

Sheifer and Vishny (1993), Wei (1997) and others have argued that it is the element of uncertainty in bribery payments that is particularly damaging. If this were the case, then the relevant independent variable would be the variance of BRIBE, as perceived by an individual firm. However, the correlation between the average of BRIBE and the variance of BRIBE, taken at the industry level[10], is 0.83, raising concerns of collinearity. In fact, when each such variable is used separately, they produce similar results; when both are included, neither is significant, presumably because of problems of multicollinearity. Note that parallel results exist for the taxation variables, where problems surrounding uncertainty are expected to be lower.

We experimented with several other potential explanatory variables, including measures of competition (number of main competitors, market share), human capital proxies of the owner/manager (higher education, years of previous experience, experience of working abroad), and structural features (distance to the capital). However, including any one of these variables in the growth equation did not significantly affect the relationship between corruption and growth.

[10] There are not enough observations in each cell at the location-industry level to examine variances.

V. Conclusion

We have shown that there is a strong, robust, and negative relationship between bribery rates and the short-run growth rates of Ugandan firms, and that the effect is much larger than the retarding effect of taxation. To our knowledge, this provides the first micro-level support for firm-based theories on the effects of corruption that have generated much attention in recent years. Much more work is still required in this area: ideally, our data would cover a much longer time horizon, and allow for a finer differentiation among theories of corruption. Currently, efforts are underway to compile these data.

The results of this paper also have significant policy implications. The donor community, and other organizations, have focused increasing attention on looking for ways to combat corruption in developing and transition countries. Our results suggest that such attention is justified by the data. Corruption significantly reduces firm growth.

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Appendix: Data description and data sources

Data source:

All data used in the paper is from the Ugandan Industrial Enterprise Survey [see Reinikka & Svensson (1999) for details]. The survey was initiated by the World Bank and was implemented during the period January-June 1998 by the UMA (an employers' association). The sampling frame was based on an Industrial census from 1996 and confined to five general industrial categories (commercial agriculture, agro-processing, other manufacturing, construction and tourism). The five sectors could be further classified into 14 three-digit ISIC-categories. Based on number of enterprises, the five sectors constituted 52 % of the private sector, and almost 80 % of employment in 1996. The chosen sample size was 250 establishments. Within these five industrial categories, commercial agriculture made up 26 % of employment, agro-processing 28 %, other manufacturing 32 %, construction 12 % and tourism 2 %. Balancing the importance of the different industrial categories at present with the likely importance in the future, the initial plan prescribed selecting 50 establishments in commercial agriculture, 50 in agro-processing, 100 in other manufacturing, 25 in construction and 25 in tourism. Five geographical regions were covered in the sample (Kampala, Jinja/Iganga, Mbale/Tororo, Mukono, and Mbarara). These regions constitute more than 70 percent of total employment. Three general criteria governed the choice of procedure in selecting the sample from the eligible establishments. First, the sample should be at least reasonably representative of the population of establishments in the specified industrial categories. Second, the establishments surveyed should account for a substantial share of national output in each of the industrial categories. Third, the sample should be sufficiently diverse in terms of firm size, to enable empirical analysis on the effects of firm size. To account for these three considerations, a stratified random sample was chosen using employment shares as weights. The final sample surveyed constituted 243 firms, and was fairly similar to the initially selected stratified sample (with respect to location and size).

Data description:

growth: Sales growth over the period 1995-1997, defined as [log(Sales in 1997) - log(Sales in 1995)]/2.
bribe: Reported bribe in Uganda Shillings. Bribe payments were reported under the following question, "Many business people have told us that firms are often required to make informal payments to public officials to deal with customs, taxes, licenses, regulations, services, etc. Can you estimate what a firm in your line of business and of similar size and characteristics typically pays each year?"
bribeiv: Average bribe payment at the location-industry level.
tax: Reported tax payment in Uganda Shillings (all types of taxes)
taxiv: Average tax payment at the location-industry level.
sales95: Gross sales in Uganda Shillings (1995).
foreign: Foreign ownership (in %).
export: Binary variable taking the value 1 if the firm exports, 0 otherwise.
lsales95: Logarithm of sales95
age: Age of firm

TABLE 1: SUMMARY STATISTICS

Variables	Mean (Std. Dev. in parentheses)	Observations
Growth	0.111 (.347)	189
Bribe	0.013 (.024)	166
Tax	0.085 (.097)	191
sales95 (in 000 USD)	1669 (6181)	197
Foreign	24.1 (39.5)	243
Trade	0.507 (.501)	227

CORRELATION MATRIX

Growth	1						
Bribe	-0.043	1					
Tax	-0.088	-0.032	1				
Lsale	-0.019	-0.144	0.172	1			
Lage	-0.105	-0.136	-0.043	0.180	1		
Foreign	.0143	-0.091	0.327	0.331	-0.122	1	
Trade	0.165	0.064	0.076	0.430	0.028	0.378	1

TABLE 2: EFFECT OF BRIBERY & TAXATION ON GROWTH, BASIC RELATIONSHIP

Dependent Variable: GROWTH

	(1)	(2)	(3)
Method	OLS	OLS	OLS
Bribe	-1.249 (.903)	-1.100 (.917)	-1.166 (.949)
Tax	-0.285 (.247)	-0.478* (.248)	-0.495** (.219)
lsales95	0.002 (.011)	-0.007 (.012)	-0.018 (.013)
log(age)	-0.052 (.043)	-0.039 (.040)	-0.038 (.046)
Foreign		0.002* (.001)	0.001 (.001)
Trade			0.125 (.077)
Cons	0.224 (.239)	0.357 (.251)	0.522* (.254)
R^2	0.02	0.05	0.08
Observations	126	126	123

Standard errors in parentheses; all regressions use Huber-White correction for heteroskedasticity, allowing for clustering by location-industry.

* Significant at the 10 percent level.
** Significant at the five percent level.

TABLE 3: EFFECT OF BRIBERY AND TAXATION ON GROWTH: INSTRUMENTAL VARIABLE ESTIMATION

Dependent Variable: GROWTH

	(1)	(2)	(3)
Method	IV	IV	IV
Bribeiv	-3.320**	-3.255*	-3.605**
	(1.558)	(1.688)	(1.688)
Taxiv	-1.342**	-1.545**	-1.696**
	(.638)	(.723)	(.715)
Lsales95	0.008	-0.006	-0.017
	(.018)	(.016)	(.016)
Log(age)	-0.063	-0.045	-0.050
	(.043)	(.040)	(.046)
Foreign		.002*	0.002*
		(.001)	(.001)
Trade			0.124*
			(.070)
Cons	0.249	0.450	0.624*
	(.340)	(.329)	(.336)
Observations	126	126	175

Standard errors in parentheses; all regressions use Huber-White correction for heteroskedasticity, allowing for clustering by location-industry.

* Significant at the 10 percent level.
** Significant at the five percent level.

The instrumental variables were generated by regressing bribery/tax rates on their industry-location averages, with all second stage controls included as covariates.

TABLE 4: EFFECT OF BRIBERY AND TAXATION ON GROWTH, OUTLIERS EXCLUDED

Dependent Variable: GROWTH

	(1)	(2)
Method	OLS	IV
Bribe	-6.354**	
	(2.961)	
Tax	-0.291*	
	(.166)	
Bribeiv		-7.821**
		(3.823)
Taxiv		-0.817**
		(.401)
lsales95	-0.012	-0.025
	(.009)	(.016)
log(age)	-0.029	-0.046
	(.027)	(.030)
Foreign	0.001	0.0013
	(.0007)	(.0009)
Trade	0.050	0.078
	(.045)	(.048)
Cons	0.397	0.748**
	(.159)	(.303)
R^2	0.11	
Observations	114	119

Standard errors in parentheses; all regressions use Huber-White correction for heteroskedasticity, allowing for clustering by location-industry.

* Significant at the 10 percent level.
**Significant at the 5 percent level.

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